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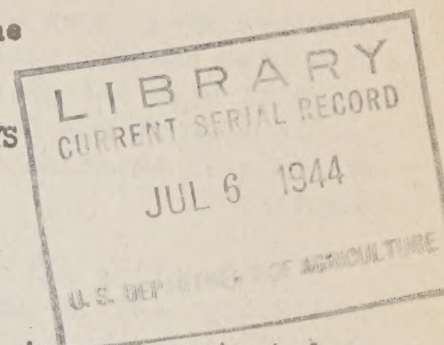
June 1944

ET-217

UNITED STATES DEPARTMENT OF AGRICULTURE  
Agricultural Research Administration  
Bureau of Entomology and Plant Quarantine

A SMALL INJECTOR FOR USE IN MIXING SPRAYS

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Many fruit growers in the West mix spray materials in a concentrated form and then pump them into the spray tank with a suction tank filler or injector. This procedure has the advantage of thoroughly mixing the materials, and it may be used for emulsifying oils, particularly the emulsive types. Also, spray materials that are difficult to wet may be thoroughly mixed in a concentrated form in a suitable container, and then any small lumps may be broken up and wetted by pumping such materials through the injector. This eliminates the need of placing them in a partly filled tank and subjecting them to agitation for several minutes before filling the tank. Such an injector may be used, too, for changing the physical characteristics of flocculated spray mixtures, which otherwise can be brought about only by continued agitation or by passing them through the spray pump.

Since regular tank fillers are awkward to handle and are not always available, a small injector made from ordinary pipe fittings has been designed, which may be used for experimental or practical orchard spraying. Such an injector is shown in figures 1 to 4.

The body of the injector is a 1-inch tee with a  $3/4$ -inch side opening. In one end of the tee is fitted a  $1" \times 3/4"$  bushing. Since this type of bushing is tapered on the inside, the taper must be removed by tapping, so that it will receive a  $3/4" \times 1/2"$  bushing, as shown in figure 1. The head of the smaller bushing must be ground off so that it will slip through the hole in the tee. A  $1/2"$  plug with a small hole drilled through the center is screwed into the small bushing. This forms a jet, the diameter of which must be determined by experiment, since the most suitable size varies with the capacity of the spray pump. A  $1/8"$  opening is about the maximum size that can be used with a pump delivering 20 gallons per minute. The plug should extend at least to the mid point of the tee for the best operation. A 1-inch pipe on the opposite end of the tee forms a suction chamber and it should be straight for at least 18 inches.

A short length of pipe may be attached to the end of the suction chamber by means of an elbow (fig. 3), and this may be used to direct the spray into the tank through the opening in the top. Or a hole may be drilled through the top of the tank near the outer edge so that the tee of the injector will extend over the edge of the tank. If this hole is made to fit snugly, no clamp will be necessary to hold the injector in place, as is the case with the other arrangement.



Other necessary equipment shown in figure 4 includes a length of high-pressure spray hose with female fittings on either end, which is attached to a hose adapter inserted in the larger bushing and which connects the injector with the pressure line from the pump. A convenient length of  $3/4$ " garden hose with a female fitting on one end may be used as a suction hose, and this is attached to the side opening of the tee by means of another hose adapter.

A 5-gallon pail is large enough for mixing the concentrated material ordinarily used in 300 gallons of spray. The time required to pump this material into the tank varies from a few seconds to several minutes, depending upon the thickness of the mixture and the pressure used. If the mixture is too thick to pass through the injector, it must be thinned, in which case a larger container may be necessary.

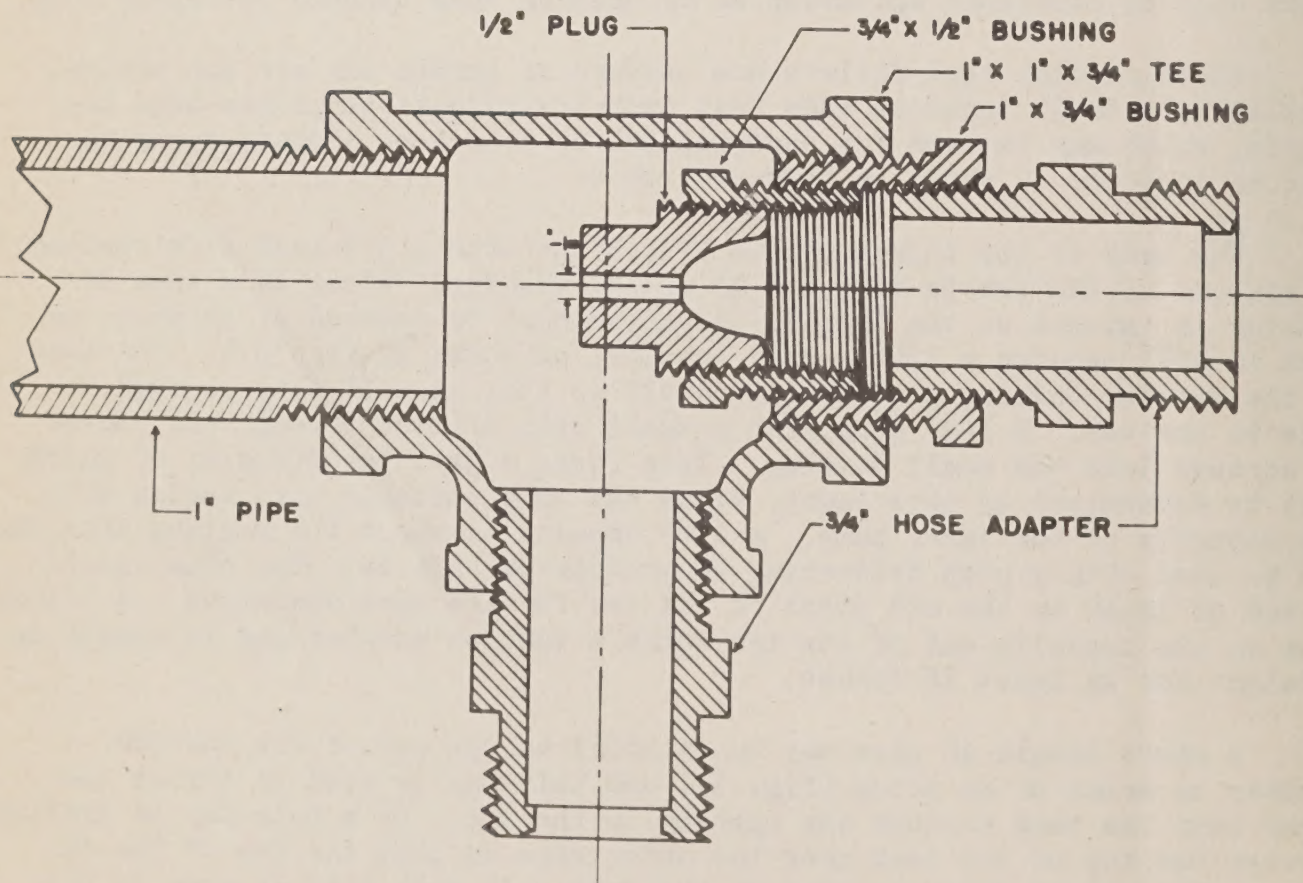


Figure 1.--Cross section of injector.



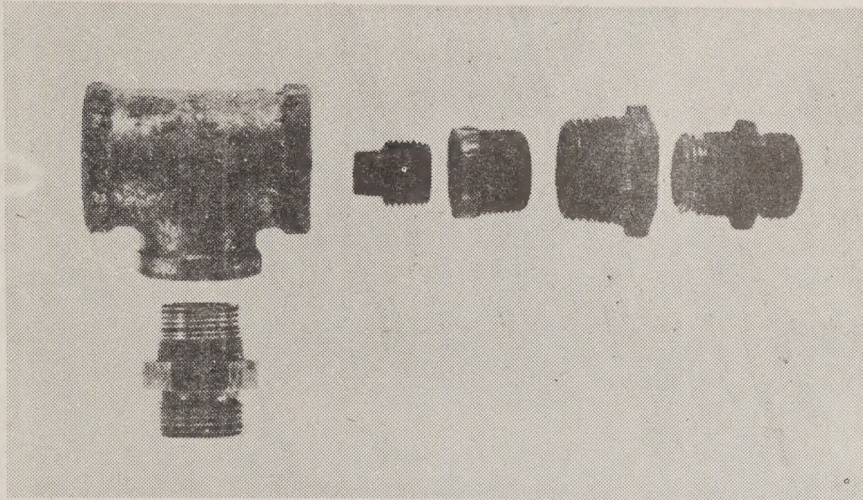


Figure 2.—Principal parts of the injector.

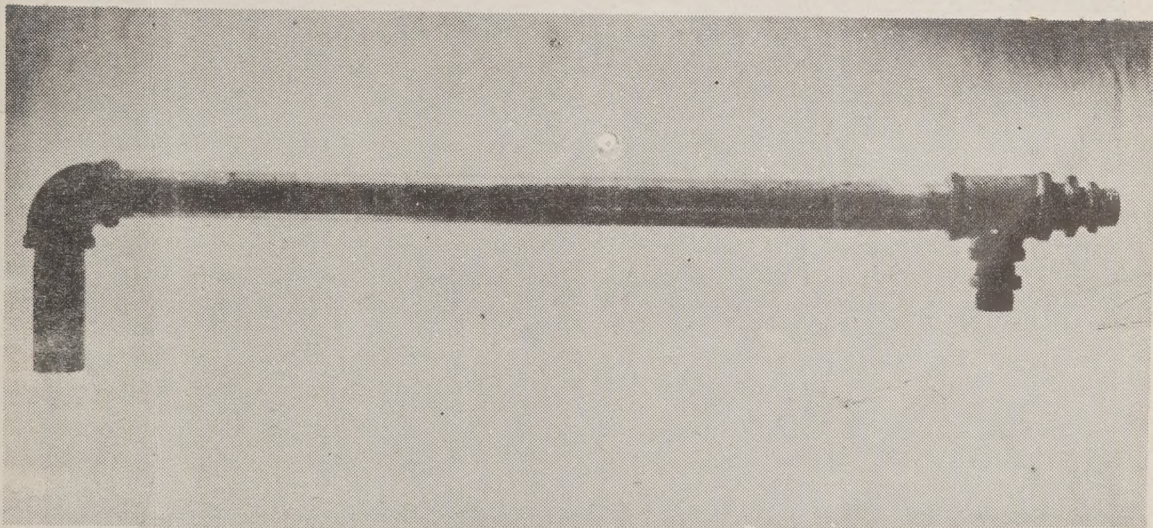


Figure 3.—Assembled injector.







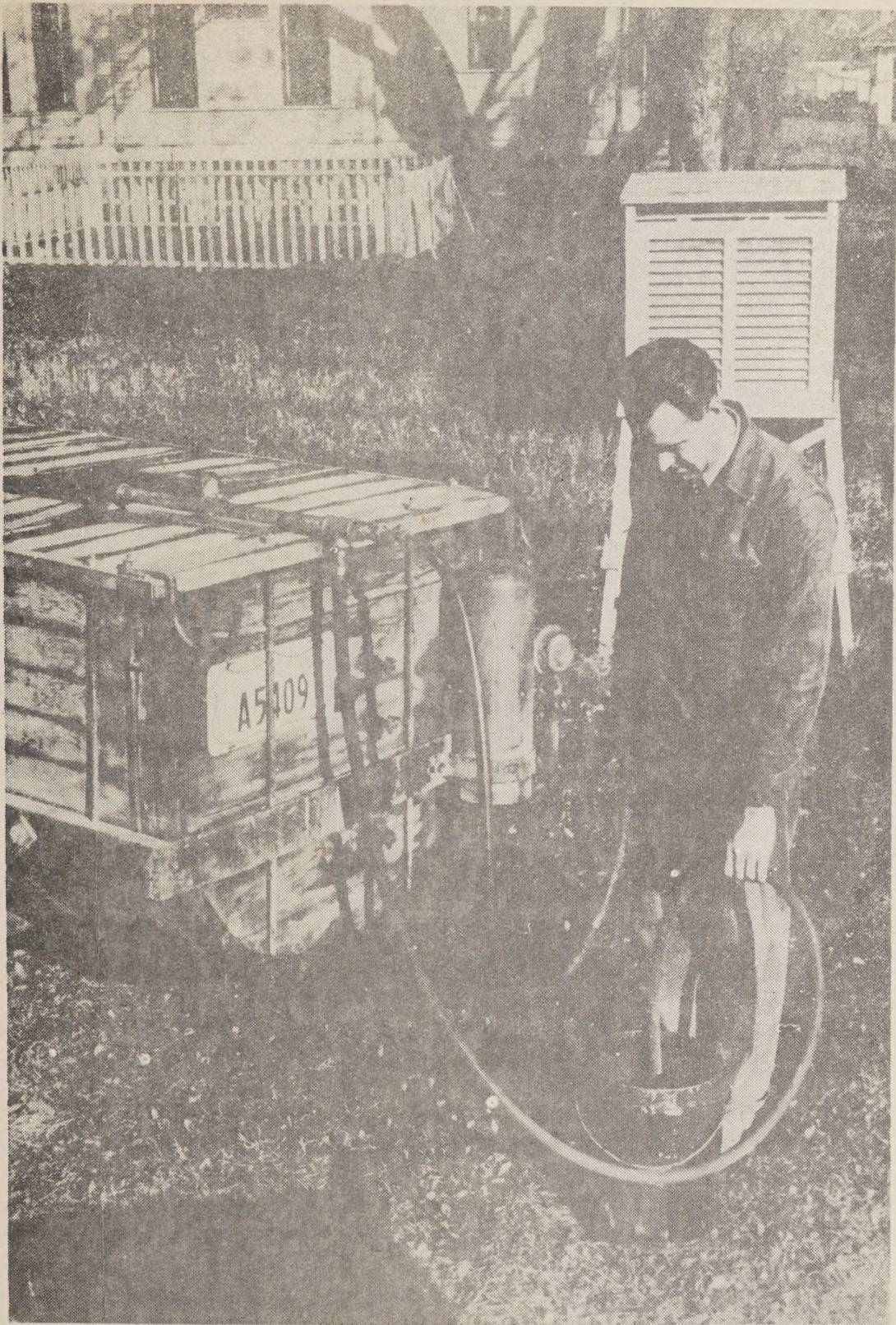


Figure 4.--Injector in operation.



